

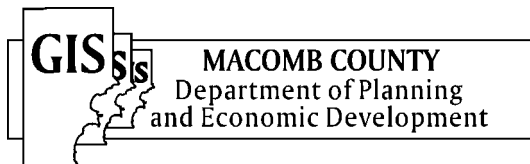
# **DIGITAL ORTHOPHOTOGRAPHY REQUEST FOR PROPOSAL**

**MACOMB COUNTY, MICHIGAN**

**DEPARTMENT OF  
PLANNING AND ECONOMIC DEVELOPMENT**

**July 30, 2001**

**Bid Number XX - 01**



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## **PART I INTRODUCTION**

- I-1. **OVERVIEW:** Macomb County, Michigan is distributing a digital orthophoto specification and soliciting responses to promote the acquisition of digital orthophotography for the geographic area of Macomb County. The purpose of this acquisition is to obtain digital orthophotography images, a digital terrain model (DTM), hydrography and road centerline planimetrics to support the following: (1) integration with Macomb County's Developing ESRI based Geographic Information System (GIS), (2) development of an accurate road centerline/address range coverage to support a variety of mapping related programs in several County Departments, (3) development of contiguous parcel coverage, (4) conflation of coverage attributes from the Southeastern Michigan Council of Governments' (SEMCOG) and Macomb County Michigan Geographic Framework (MACMGF) road centerline to a stereo compiled road centerline file, (5) future development of two foot (2') topographic contours for preliminary engineering and hydrologic modeling.
- I-2. **BACKGROUND:** Macomb County is located in the northern portion of the Detroit, Michigan metropolitan area (**Attachment A** – Location Map) The County encompasses 482 square miles containing 13 geographic townships. Macomb County's 1990 population of 717,400 ranks the County third in population in Michigan. The County has approximately 316,600 parcels of property and an increase, or maintenance load of 5,000 parcels per year. Macomb County is bounded on the north by Lapeer and St. Clair counties, on the west by Oakland County, on the south by Wayne County and on the east by Lake St. Clair.

Beginning in the early 1990's, the Macomb County Department of Planning and Economic Development entered the GIS arena with the acquisition of MapInfo mapping software. Internal and external departmental needs focused on the development of maps and applications which relied heavily on the U.S. Census Department's 1990 Census of Population and Housing STF1A, STF1B, and 1990 TIGER Line Files. Recognizing a growing need for more precise data sets, Department staff began creating custom data sets for both internal and external County department/agency uses. Relying upon data contained within the Michigan Resource Inventory System (MIRIS) [based upon 1:24,000 U.S.G.S. 7.5' quadrangle maps], some of the first successful projects included assisting in developing flight lines for the County's gypsy moth suppression program and the development of a County maintained drains coverage. In the spring of 1999, the Department migrated its GIS operations to ESRI based products. Current projects include the development and maintenance of a countywide road centerline coverage to assist in law enforcement dispatch

and the development of a county wide parcel coverage. Phase I of parcel coverage development, which encompassed heads up digitizing of the property boundaries of 2,600 map sheets, has been completed. The current phase, phase II, includes attribution of parcel tax ID numbers and deeded dimension data. The final phase, phase III, will focus on the construction of a contiguous map coverage of all the parcels. This phase will rely greatly upon the acquisition of digital orthophotography in the spring of 2000.

## **PART II**

### **INSTRUCTIONS AND GENERAL INFORMATION FOR THE CONTRACTOR**

- II-1. **PROBLEM STATEMENT:** The Macomb County Department of Planning and Economic Development (the Department) is seeking assistance from qualified consultants to conduct a spring 2000 digital orthorectified aerial photography flight according to an approved Work Program to be developed by the selected Respondent and approved by the Department.

Process. The proposal submitted to meet the requirements listed in this Request For Proposal (RFP) will outline the various tasks required to create orthorectified photography and the requested planimetric coverages. When all the proposals have been reviewed through the vendor selection process, and a contractor is selected, the project may proceed.

Timing. The flight is to be conducted in the spring of 2000, prior to leaf formation. Priority is to be placed on completing the road centerline file and subsequent conflation and returning this product back to the Department. The remainder of the products will be returned to the Department in a timely manner as described in this RFP under the section of QA/QC.

Funds. Project funds for the digital ortho flight are authorized by the Macomb County Board of Commissioners. Funds are only available to pay for the work authorized by the Macomb County Board of Commissioners, based on a selected proposal that meets the requirements of this RFP.

II-2. **RFP CONTACT BETWEEN MACOMB COUNTY AND RESPONDENTS**

Questions concerning technical specifications should be directed to Mr. Richard C. Roose, while bid process questions should be directed to Mr. Greg Faremouth. After completing the **Intent to Respond Form (Attachment B)**, Respondents may fax or submit a written request with questions to:

**Bid Process Specifications:**

Mr. Greg Faremouth, Buyer  
Macomb County Purchasing  
10 N. Main Street  
Mt. Clemens, Michigan 48043  
Phone: (810) 469-7480  
Fax: (810) 469-6612

**Technical Specifications:**

Mr. Richard C. Roose  
Director Planning & Operations  
Department of Planning & Economic Dev.  
1 South Main  
Mt. Clemens, Michigan 48043  
Phone: (810) 469-5285  
Fax: (810) 469-6787

- II-3. **TYPE OF NEGOTIATIONS :** Negotiations may be undertaken with those Respondents

whose proposals as to price and other factors show them to be qualified, responsible and capable of performing the work. The contract that may be entered into will be that most advantageous to the County in terms of price and other factors considered. The Macomb County Department of Planning and Economic Development reserves the right to consider proposals or modifications thereof received at any time before award is made, if such action is in the best interest of the County.

- II-4. **REJECTION OF PROPOSALS:** The Macomb County Department of Planning and Economic Development reserves the right to reject any and all proposals received as a result of this RFP, or to negotiate separately with any source whatsoever in any manner necessary to serve the best interests of the County. This RFP is made for information or planning purposes only. The Department does not intend to award a contract solely on the basis of any response made to this request.
- II-5. **INCURRING COSTS:** Macomb County is not liable for any cost incurred by contractors prior to issuance of a contract.
- II-6. **INQUIRES:** Prior to the Department answering any questions regarding the RFP, Respondents must submit an **Intent to Respond Form (Attachment B)**. Questions that arise subsequent to the release of the RFP must be submitted in accordance with section II-2. Questions and answers thereto will be provided all Respondents; however, the names of Respondents submitting questions will not be disclosed.
- II-7. **ADDENDA TO THE RFP:** In the event it becomes necessary to revise any part of this RFP, addenda will be provided by certified mail to all contractors who received the basic RFP.
- II-8. **RESPONSE DATE:** To be considered, proposals must arrive on or before 2:00 P.M., E.S.T. October 4, 1999 and delivered to:

Macomb County Purchasing Department – 13<sup>th</sup> Floor  
Attn: Mr. Wallace Evans, Purchasing Manager  
10 N. Main Street  
Mt. Clemens, Michigan 48043  
RE: Digital Orthophotography RFP – SEALED BID ITEM XX-99  
Solicitation Deadline: Monday, October 4, 1999 – 2:00 P.M.

- II-9. **PROPOSALS:** To be considered, Respondents must submit a complete response to this RFP that must follow the format provided in the chart in **Section V-10**. In addition, the Respondent must provide 10 copies of the proposal to the Purchasing Department. No other distribution of proposals will be made by the Respondent. Proposals must be signed by an official authorized to bind the Respondent to its provisions. For this RFP, the proposal must remain valid for at least 60 days.
- II-10. **ACCEPTANCE OF PROPOSAL CONTENT:** The contents of the proposal of the

successful Respondent will become contractual obligations, if a contract ensues. Failure of the successful Respondent to accept these obligations will result in cancellation of the award.

- II-11. **ECONOMY OF PREPARATION:** Proposals should be prepared simply and economically, providing a straightforward, concise description of the Respondent's ability to meet the requirements of the RFP. Emphasis should be on completeness and clarity of content.
- II-12. **ORAL PRESENTATION:** Select Respondents who submit a proposal may be required to make an oral presentation of their proposal to the Macomb County Department of Planning and Economic Development and a Technical Review Committee as appropriate. These presentations provide an opportunity for the Respondent to clarify their proposal to insure thorough mutual understanding. If needed, the Department will schedule these presentations.
- II-13. **PRIME RESPONDENT RESPONSIBILITIES:** It is the responsibility of the selected Respondent to provide all products offered in the RFP regardless if they are created by a third party. Further, the Department will consider the selected Respondent to be the sole point of contact with regard to contractual matters, including payment of any and all charges resulting from the contract.
- II-14. **CONTRACT PAYMENT SCHEDULE:** Payment for any contract entered into as a result of this RFP will be negotiated with the successful Respondent.
- II-15. **NEWS RELEASES:** News releases pertaining to this RFP or the service, study or project to which it relates will not be made without Department approval.
- II-16. **DISCLOSURE OF PROPOSAL CONTENTS:** After contract award, a summary of total price information for all submissions will be furnished to those Respondents participating in this RFP upon their request. Except for this summary of total prices, cost and price information provided in the proposal will be held in confidence and will not be revealed or discussed with competitors. If a proposal contains any information that the Respondent does not want disclosed to the public or used by the Government for any purpose other than evaluation of their offer, each sheet of such information must be marked with the following legend:
- “This information shall not be disclosed outside the Macomb County Department of Planning and Economic Development or be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offerer, or as a result of, or in connection with the submission of such information, the Planning and Economic Development Department shall have the right to duplicate, use or disclose this information to the extent provided in the contract. This restriction does not limit the right of the Department to use information contained herein if obtained from another source.”
- II-17. **INDEPENDENT PRICE DETERMINATION**

a. By submission of a proposal, the offerer certifies, and in the case of a joint proposal each party thereto certifies as to its own organization, that in connection with this proposal:

(1) The prices in the proposal have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other offerer or with any competitor; and

(2) Unless otherwise required by law, the prices which have been quoted in the proposal have not been knowingly disclosed by the offerer and will not knowingly be disclosed by the offerer prior to award directly or indirectly to any other offerer or to any competitor; and

(3) No attempt has been made or will be made by the offerer to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

b. Each person signing the proposal certifies that:

(1) He/She is the person in the offerer's organization responsible within that organization for the decision as to the prices being offered in the proposal and that he/she has not participated, and will not participate, in any action contrary to a. (1), (2) and (3) above: or

(2) He/She is not the person in the offerer's organization responsible within that organization for the decision as to the prices being offered in the proposal but that he/she has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to a. (1), (2) and (3) above, and as their agent does hereby so certify; and that he/she has not participated, and will not participate, in any action contrary to a. (1), (2) and (3) above.

c. A proposal will not be considered for award if the sense of the Statement required in the Cost and Price Analysis portion for the proposal has been altered so as to delete or modify a. (1), a.(3) or b. above. If a.(2) has been modified or deleted, the proposal will not be considered for award unless the offerer furnishes with the proposal a signed statement which sets forth in detail the circumstances of the disclosure and the Department determines that such disclosure was not made for the purpose of restricting competition.

**II-18. OFFERER LIABILITY:** The offerer will provide and maintain public liability, property



damage, and worker's compensation insurance insuring, as they may appear, the interests of all parties to any agreement that results from this RFP. The offerer is responsible for insuring that all precautions are exercised at all times for the protection of all persons and property. The offerer shall secure all necessary certificates and permits from municipal or other public authorities and comply with all national, State and municipal laws, ordinances and regulations as may be required.

## **PART III**

### **SCOPE OF WORK**

- III-1. **OVERVIEW:** The following sections outline the five key areas of the proposed work. Respondents are encouraged to offer suggestions for improving upon the specifications, requirements and data designs presented. It is the Respondent's responsibility to describe thoroughly how the work detailed in each section will be completed and to include all relevant specifications and parameters. The Department reserves the right to modify and further develop project specifications with the selected Respondent.
- III-2. **SURVEY CONTROL NETWORK DEVELOPMENT:** The survey control network developed for this project should support topographic/planimetric mapping at National Map Accuracy Standards (NMAS) for 1" = 200' or 1:2,400 scale mapping and support the future development of a two foot (2') contour coverage. Horizontal and vertical ground control for the project should leverage the County's existing GPS network. The current network is a product of the State of Michigan's remonumentation program and consists of a countywide grid of control points at three-mile intervals tied to two National Geodetic Survey (NGS) HARN stations. These points have been set to NGS standards and are blue book qualified. Additional ground control, determined as necessary to densify the existing grid, must be collected and recorded in the State Plane Coordinate System (Michigan South, NAD 83 datum, international feet; NAVD 88). All ground control utilized in the project must be targeted in photo identifiable locations. A report detailing existing horizontal and vertical control is available from the Macomb County Department of Planning and Economic Development. Respondents must detail collection procedures, the number and spatial alignment of control points necessary to densify the County's existing control network and in what type of report the information will be given to the County.
- III-3. **AERIAL PHOTOGRAPHY ACQUISITION:** The aerial photography collected for this project must support the development of digital orthophotos with a 6" pixel resolution and the ability to be utilized for 1"=200' or 1:2,400 scale planimetric work. Additionally, the digital orthophotography must support the future development of contours at NMAS of 2' vertical. New black and white aerial photography must be obtained in the spring of 2000. All photography must be taken from the same altitude to assure an appropriate photo negative scale. The aerial photography must be obtained when the sky is clear of clouds, haze, smoke, dust and when ground and water bodies are free of snow and ice. Further, all deciduous trees must be in a leaf off state to ensure minimum ground obstruction from the existing tree canopy. Acquisition of photography within the east central portion of the County (Harrison Township) will require Department of Defense (DOD) clearance for entry into Selfridge Air National Guard Base airspace.

Aerial camera specifications and all approved flight plans must be submitted to the Department prior to acquiring the imagery. In addition, the successful respondent shall notify the Department on the day that the photography is being taken for verification of conditions. Any aerial photography that does not meet the final specifications defined within the project contract must be corrected at no additional cost to the County. Further, any and all reflights must coincide with the same accepted specifications and flight parameters.

Any RFP response must include a detailed report containing all relevant specifications/parameters for acquiring aerial photography, including, but not limited to the below list.

|                  |                                 |                         |
|------------------|---------------------------------|-------------------------|
| Flight altitude  | Camera Specifications           | Flight Lines/Direction  |
| Maximum Crab     | Maximum Sun Angle               | Coverage of Photo Frame |
| Proposed Endlap  | Film Type                       | Negative Scale          |
| Proposed Sidelap | Time of Day For Flight          |                         |
| Maximum Tilt     | Qualifications for DOD Airspace |                         |

III-4. **DIGITAL ORTHOPHOTOGRAPHY PRODUCTION:** A digital scanner must be used to create the digital orthophoto images. Digital orthophotos are required. Scanned rectified photos will not be accepted. All photography must be scanned at a resolution not to exceed 15 microns (1,693 dots per inch) and must support a pixel resolution of 6". Delivered images must be seamless, tone matched and void of dust and scratches. All images must be georeferenced, edge matched and free of any pixel gaps. Grey-tone and density matching must be completed on each digital ortho image. The Department has developed procedures and criteria for quality control and quality assurance (QA/QC) for evaluating the quality of images once delivered (detailed in Part VI). Any digital images that do not meet these criteria will be returned to the successful Respondent for reprocessing at no additional cost to the County.

**III-4. DIGITAL ORTHOPHOTOGRAPHY PRODUCTION (continued):**

The following tiling schemes are proposed for the deliverable images:

- ¼ Public Land Survey Section – uncompressed TIFF
- ¼ Public Land Survey Section – compressed TIFF – Mr. SID
- Geographic Township (36 sq. mi.) – resampled - uncompressed TIFF
- Geographic Township (36 sq. mi.) – resampled - compressed TIFF – Mr. SID
- Entire County – resampled – uncompressed TIFF
- Entire County – resampled – compressed TIFF – Mr. SID

Deliverable products must be georeferenced, tiled and compressed using methods and techniques compatible with ESRI products.

- III-5. DIGITAL PLANIMETRIC FEATURE COMPILATION:** Digital planimetric features required for this project include road centerline and hydrography features for the County plus an extension of at least 100' outside of the County boundaries. It is the County's intention to leverage existing road centerline and County drain information, currently existing at diverse scales, to develop positionally accurate, attributed digital ArcInfo coverages. This work will include the following: 1.) Spatial enhancement of existing SEMCOG 1995/Macomb County Michigan Geographic Framework (MACMGF) road centerline file, 2.) Addition of all post 1995 SEMCOG MACMGF road centerlines, 3.) Development of countywide hydrography coverage, 4.) Optional spatial enhancement of SEMCOG 1995 community boundary file, 5.) Optional spatial enhancement of existing CLEMIS law enforcement boundary coverages.

*Spatial Enhancement of SEMCOG MACMGF  
& Optional Community Boundary Coverage*

Stereo compiled road centerlines will be used to generate the raw vector line work that will form the foundation for spatial enhancement. The Respondent must improve the spatial accuracy of the current SEMCOG MACMGF so that road centerlines and optional community boundaries correspond geometrically to the raw vector lines captured during orthophotography production. Further, new roads constructed after 1995 or roads omitted during the original SEMCOG MACMGF coverage development will be added to the final road centerline coverage. The Department will work with the Respondent to develop rules for road centerline development, including, but not limited to rules for collecting divided highways, boulevards, courts, ramps, frontage roads, mobile home park roads, private roads, alleys and access to townhouse, apartment and condominium complexes, as well as any other travel ways required by the County. The Department will also work with the successful Respondent to develop detailed standards for line coverage development such as, road intersection node snapping, direction of travel, etc. Further, the Department will work with the

successful Respondent to develop rules for resolution of differences between the new road centerline and the SEMCOG file. The Department will provide the successful Respondent with copies of the SEMCOG MACMGF and SEMCOG community boundary coverages for the County.

**Required Planimetric Features**

| <b>Transportation</b>                |
|--------------------------------------|
| Road centerline (line)               |
| Bridges, overpasses (line & polygon) |
| Railroad centerline (line)           |
| Alleys (line)                        |

Information regarding the SEMCOG MACMGF road centerline coverage is contained in **Attachment C** - “SEMCOG MACMGF Road Centerline Coverage”

Data designs for attribution of the road centerline coverage are contained in **Attachment D**, “Macomb County GIS Data Designs”

Data designs for attribution of the community boundary coverage are contained in Attachment D, “Macomb County GIS Data Designs”

Guidelines for collection of road centerline features can be found in **Attachment E**, “Michigan Geographic Framework – Road Classification Standards, July 1996”

*Countywide Hydrography Coverage*

Stereo compiled water features will be used to develop the raw vector line work that will form the countywide hydrography coverage. Both contiguous line and polygon coverages are required for purposes of network modeling and delineation of water bodies such as, lakes, ponds, retention basins, etc. The detailed types of water elements to be captured shall be the same as the 1990 TIGER Line hydrography and MIRIS line coverages for the County. The Department will provide the successful Respondent with copies of the 1990 TIGER Line hydrography and MIRIS hydrography coverages for the County as reference materials. It is important to note, that the Department wishes to use TIGER and MIRIS as a basis for the design of the database, but it is expected of the selected vendor to collect all water bodies. The Department will work with the successful Respondent to develop standards for collecting the needed line work for this coverage.

**Required Planimetric Features**

| Hydrography                   |
|-------------------------------|
| Shoreline (line)              |
| Rivers (line & polygon)       |
| Streams, creeks (line)        |
| Lakes, ponds (line & polygon) |
| Drains (line)                 |
| Bulkheads, jetties (line)     |

### *Optional Spatial Enhancement of CLEMIS Law Enforcement Boundary Coverages*

The Respondent must improve the spatial accuracy of the CLEMIS Law Enforcement Boundary coverages so that current polygon coverages, which are defined by road centerlines and community boundaries, align spatially with the raw vector lines captured during orthophotography production. If selected as an option, the Department will provide the successful Respondent with ArcInfo coverages of the CLEMIS Law Enforcement Boundaries.

Data designs for the CLEMIS Law Enforcement Boundary coverages are contained in Attachment D, “Macomb County GIS Data Designs”

- III-6. DIGITAL FILE CONFLATION OF EXISTING ROAD CENTERLINE AND COUNTY DRAIN ATTRIBUTE INFORMATION:** The Respondent will be required to conflate and automate address ranges to the raw road centerline vector file. The Department will provide the successful Respondent with a copy of the SEMCOG MACMGF road centerline coverage, hard copy maps and any other available files that will provide information related specifically to known road names and address ranges. Any value-added sources suggested by the Respondent will also be considered for source material. The County recognizes the fact that road centerline segmentation will differ from that of SEMCOG MACMGF segmentation and will work with the successful Respondent to develop standards for resolving these issues. It is required that SEMCOG MACMGF segmentation be preserved along with its Census TIGER line code values.

The Respondent will also be required to match attribute data contained within the Macomb County Maintained Drains coverage with the raw hydrography line work. The Department will provide the successful Respondent with copies of the Maintained Drains coverage.

The successful Respondent must also produce from the final road centerline coverage, an Access 97 database of unique road names by community.

- III-7. SAMPLE OF PRODUCTS ON CD:** The Department requests a sample of similar work.

The data should be provided on a CD and must include two contiguous digital orthophoto tiles, DTM, and vector data capture. All the sample data must come from the same project to allow for analysis of data integration. The Department will use similar techniques listed in the QA/QC section to review the sample data.

### III-8. **PERFORMANCE REQUIREMENTS:**

#### *ArcInfo Coverage Format Deliverables*

At a minimum, the Respondent must provide each requested data set in the ArcInfo coverage formats detailed in **Attachment D** - “Macomb County GIS Data Designs”. Furthermore, exact attribute formatting and improvements to the published data designs may be discussed during contract negotiations. Changes in the SEMCOG MACMGF’s TIGER line coding or attribute relationships will not be permitted.

The road centerline and address range coverage must have network topology and nodes placed at intersections. If a road name or address range changes along a road and is not coincident with an intersection, then a node must be placed at that location. If the local city, village or township jurisdiction changes along a road and is not coincident with an intersection, then a node must be placed at that location.

All data must be delivered in the Michigan State Plane South Zone Coordinate System, using the North American Datum (NAD 83), NAVD 88. The grid unit of measurement must be international feet.

Annotation must be added to the coverage in compliance with the data design description. Each piece of annotation must be scaled to support 1”=100’ or 1:1,200 scale map production and placed strategically to avoid clutter. The annotation should be developed using the ¼ section based tiling scheme. More specific cartographic output requirements will be finalized during contract negotiations with the successful Respondent.

All coverages must be delivered in ArcInfo NT v. 7.2.1 format. If available at the time of delivery, a more current ArcInfo format may also be accepted.

## **PART IV**

### **DELIVERABLES / FINAL PRODUCTS**

- IV-1. **Final Products:** All final products must be submitted to the Department and will become the property of Macomb County. The Department reserves the right to negotiate to allow the successful Respondent to hold the copyright to the products if the Department deems that as being in the best interest of the County. In addition, the Department reserves the right to negotiate inclusion of all or a portion of the products listed below into the final contract. Products will not become final deliverables until they have been processed through both the successful Respondent's QA/QC process and the Department's QA/QC process and have been deemed acceptable by the Department.
- IV-2. **Delivery Coordination:** For purposes of internal QA/QC the County requires that final photo images be delivered in groups of geographic townships, along with their corresponding ArcInfo coverages. It is the intention of the Department to QA/QC these images and coverage tiles together, returning erroneous images and coverages to the successful Respondent for correction. Correction of errors, if technically feasible, will be required before the next geographic township delivered for QA/QC. This approach is necessary to facilitate the continuation of the Department's parcel conversion program. Details of this requirement, including a list detailing the order of geographic townships to be delivered, will be addressed during contract negotiations with the successful Respondent.
- IV-2. **Final Products List:** Listed below are the required final products along with brief descriptions as to how the Department envisions the development of the individual products.
- 1) **DTM Breaklines Coverage:** - Breaklines in a DTM are used to deal with abrupt changes in elevation which are associated with ridges, escarpments, ravines, or other linear features. These are captured as lines on the earth's surface, which have a known elevation, as well as known positional coordinates.
  - 2) **DTM Masspoints Coverage:** – Masspoints in a DTM are points on the earth's surface having a known elevation, as well as known positional coordinates. They are used in the rectification of aerial photography into orthophotos and in adjusting other data to account for distortions due to terrain.
  - 3) **Hydrography Coverage:** – This coverage will include digitizing all lakes, ponds, rivers, streams, creeks, and drainage ditches. The new file will be conflated with existing hydrography coverages provided by the Department to attach a name to each arc. The hydrography file will be subdivided according to whether the feature can be represented as a linear feature (arc) or an area feature (polygon). All area features will be represented by both a polygon and an arc to allow flow analysis to be completed with the coverage.



- 4) **Road Centerline Coverage:** – This file will include arcs that are approximately located in the center of the roadway. Through a conflation process to be conducted by the successful Respondent, the raw line work derived from the orthophoto will be associated with the attributes from the SEMCOG MACMGF road centerline coverage.
- 5) **Road Name Database:** - Access 97 file developed from the final road centerline coverage of unique road names by community.
- 6) **¼ Public Land Survey System (PLSS) Sections:** - The Department requires that the smallest photo image be ¼ sections of the PLSS. The files shall be provided in TIFF World File format and be non-compressed. In addition, the ¼ section PLSS shall be made available to the Department in Mr SID TIFF World File format. The successful Respondent shall include an ArcInfo image catalog or some other type of image index to be finalized during the negotiations of the contract.
- 7) **¼ Sections of Geographic Townships:** - The second photo image set shall be geographic townships that will be provided in both resampled and Mr. SID format. The successful Respondent shall include an ArcInfo photo catalog or some other type of photo index to be finalized during the negotiations of the contract.
- 8) **Countywide Image:** - The selected successful Respondent shall produce for the Department a countywide image that will be supplied in two formats. The first format shall be the county resampled and provided in a TIFF World File. The second shall be the county provided in a compressed Mr. SID format.
- 9) **Hardcopy Deliverables:** - The selected successful Respondent shall supply the Department with the photo negatives. In addition, the successful Respondent shall supply annotated hardcopy prints of the road centerline and hydrography coverages and their corresponding electronic files to be used in the QA/QC process. The prints should be created at a scale that makes the attribute data legible when placed next to the corresponding arcs.
- 10) **Metadata:** - The successful Respondent shall supply the Department with metadata on all the products created during the completion of this RFP.
- 11) **Errata Reports:** - Errors and data discrepancies found during the conflation and data automation processes must be reported in the form of Errata sheets. The specific format and content for the Errata sheets will be finalized during contract negotiations.

IV-3. **OPTIONAL DELIVERABLES:** The Department wishes to seek bids for further work that may or may not be included in the final scope of work depending on each item's individual cost and its impact to the overall cost of this project. The Department asks each successful Respondent to include a cost for completing the following tasks.

- 1) **Community Boundaries:** - The Department will provide the successful Respondent with an existing coverage of the community boundaries. The file shall be spatially adjusted to fit the new more accurate photo base. The successful Respondent shall return to the Department a coverage of the community boundaries, with all attribute data attached, in the more accurate spatial location.
- 2) **Conflation of CLEMIS Law Boundaries:** - The Department will supply the successful Respondent with a series of coverages that have been created for the Macomb County Sheriff's dispatch. Included are polygon coverages for the Sheriff's Patrol Areas, EMS Districts, Fire Districts and Tow Districts.

The Department reserves the right to modify or alter the specific requirements of each of these products once a successful Respondent has been selected and the successful Respondent and Department enter into contract negotiations.

## **PART V**

### **INFORMATION REQUIRED FROM CONTRACTOR**

Proposals must address each section listed below and be submitted in the format outlined below:

- V-1. **BUSINESS ORGANIZATION:** State the full name and address of your organization and, if applicable, the branch office that will perform or assist in performing the work hereunder. Indicate whether you operate as an individual, partnership or corporation; if as a corporation, include the state in which you are incorporated. If appropriate, state whether you are licensed to operate in the State of Michigan. In addition, state similar information for all sub-contractors that will be included in the proposal.
- V-2. **STATEMENT OF THE PROBLEM & MANAGEMENT SUMMARY:** State in succinct terms your understanding of the problem presented by this RFP. Include a narrative description of the proposed effort in completing the tasks listed in the “scope of work” section of this RFP.
- V-3. **WORK PLAN:** Describe in narrative form your technical plan for accomplishing the work. Indicate the number of person-hours you have allocated for each task and specify whether the work will be completed by your organization or a sub-contractor. Include a calendar that depicts the number of days or weeks each task will take and an anticipated date for the completion of each task.
- V-4. **PROGRESS REPORTS:** The successful Respondent will supply the Department with periodic updates on the progress of the project. The report shall briefly describe how the successful Respondent is meeting their calendar timeline.
- V-5. **PRIOR EXPERIENCE IN DIGITAL ORTHOPHOTO CREATION, PLANIMETRIC CAPTURE AND CONFLATION:**  
Proposals submitted should include, in this section, qualifying experience. This section should include project descriptions (including population and size of area), costs, and starting and completion dates of projects successfully completed. Also, the name, address, and phone number of the responsible official of the client organization who may be contacted. Include information on the experience of sub-contractors as it relates to their role in meeting the requirements of this RFP. Indicate prior work that included deliverables in ESRI, ArcInfo formats. If you have completed prior work in Michigan, include information on these projects.
- V-6. **PERSONNEL:** The consulting firm must be able to staff a project team that possesses talent and expertise in the field of orthophotography production, planimetric capture, and conflation. Include the number of executive and professional personnel by skill and qualification that will be employed in the work. Identify key individuals by name and title

and provide a summary of their prior experience in the task that they will be doing during the completion of this RFP work.

V-7. **AUTHORIZED NEGOTIATORS:** Include the names and phone numbers of personnel of your organization authorized to negotiate the proposed contract.

V-8. **COSTS AND PRICE ANALYSIS:** The information requested in this Section is required to support the reasonableness of your quotation and is for internal staff use only. The Department reserves the right to renegotiate cost if contractor should receive award for flying any neighboring counties. The data will be held in confidence and will not be revealed to or discussed with competitors. Respondents are required to address each of the items below and to complete the cost analysis form found in **Attachment F**.

1. **Personnel Costs.** Itemize so as to show the following for each category of personnel with different rate per hour:
  - a) Category; e.g., project manager, senior analyst, etc.
  - b) Estimated hours
  - c) Rate per hour
  - d) Total cost for each category and for all personnel needs
2. **Survey control network densification**
3. **Aerial photo acquisition**
4. **Digital orthophoto production**
5. **Planimetric compilation**
6. **Conflation of the road centerline coverage**
7. **Conflation of hydrography coverage**
8. **Optional spatial alignment of community boundaries coverage**
8. **Optional spatial alignment of CLEMIS Law Enforcement Boundaries**
9. **Production of deliverables**
10. **Other direct costs.** Itemize

11. **General and administrative burden or overhead.** Indicate percentage and total.
  12. **Transportation costs.** Show travel costs and per diem separately.
  13. **Total price bid for project.**
  14. **Independent price determination.** Include a statement substantially as follows:  
“This cost and price analysis is submitted in full compliance with the provisions of the paragraph titled ‘Independent Price Determination’ in Part II of the RFP to which this proposal is a response.”
- V-9. **ADDITIONAL INFORMATION AND COMMENTS:** Include any other information that is believed to be pertinent but not specifically asked for elsewhere.

**V-10. RESONDENT COMPLIANCE, RESPONSE AND PRICING**

**IMPORTANT NOTE:**      *Respondent by submitting this bid agrees and understands the stated paragraphs and agrees to comply in full.*

Respondents must use the following chart as a method for assuring that all sections of the RFP have been completed. Place a check in the completed column after the section has been addressed. Respondents shall mark the “Exception” column for each paragraph item that the respondent does not agree to comply in full. “Exceptions” to the stated requirements must be fully explained in an Appendix to the Respondent’s response to the RFP with each paragraph item identified by number and description.

| <b>Section</b> | <b>Description</b>                                       | <b>Completed</b> | <b>Exception</b> |
|----------------|--|------------------|------------------|
| Attachment B   | Formal Intent To Respond is Mailed                       |                  |                  |
| III-2          | Explain The Development of the Survey Control Network    |                  |                  |
| III-3          | Explain Process of Aerial Photography Acquisition        |                  |                  |
| III-4          | Explain Digital Orthophoto Production                    |                  |                  |
| III-5          | Explain Planimetric Feature Compilation                  |                  |                  |
| III-5          | Roads  |                  |                  |
| III-5          | Hydrography  |                  |                  |
| III-6          | Explain Conflation Process                               |                  |                  |
| III-7          | Provides a CD with the required sample data              |                  |                  |
| III-8          | Can Supply Coverages in ArcInfo Format                   |                  |                  |
| IV             | Is able to meet all the Final Delivery Specifications    |                  |                  |
| V-1            | Supplies Information on Business Organization            |                  |                  |
| V-2            | Supplies a Statement of the Problem                      |                  |                  |
| V-3            | Includes Workplan  |                  |                  |
| V-3            | Includes a Calendar of the Proposed Work Plan            |                  |                  |
| V-5            | Prior Experience   |                  |                  |
| V-5            | Inclusion of Reference Addresses and Phone Numbers       |                  |                  |
| V-5            | Inclusion of Experience of Subcontractors                |                  |                  |
| V-6            | Provide Detailed Experience and Skill of Key Individuals |                  |                  |
| V-7            | Include Authorized Negotiator                            |                  |                  |
| V-8            | Address all Elements of the Cost Breakdown               |                  |                  |
| Attachment F   | Complete Cost Response Form                              |                  |                  |

## PART VI

### MACOMB COUNTY PROCEDURES FOR QUALITY ASSURANCE AND QUALITY CONTROL

- VI-1. **INTRODUCTION:** The successful Respondent will be responsible for ensuring that all deliverables are in compliance with the requirements set forth in this document and during contract negotiations. Specific quality control procedures that will be used should be described in the response.

The Macomb County Department of Planning and Economic Development has developed the following procedures for analyzing delivered photo images and vector coverages.

- VI-2. **ArcInfo Coverages:** The Department has developed a unique coding key (*section V-4*) for identifying problems that may occur during the development of the deliverable ArcInfo coverages. As geographic township coverage tiles are delivered the Department will append five unique items to the coverage Info files titled Error\_Flag (Binary), Error\_Type (Numeric), Comment (Character), Fix (Yes/No), and Fix\_Comment (Character). Once analyzed, the flagged coverages will be returned to the selected Respondent for correction. The respondent will use the fix and fix\_comment field to relay any information regarding corrections to the coverage.
- VI-3. **Orthophoto Tiles:** The Department has developed a unique coding key (*section V-4*) for identifying problems that may occur during the development of the deliverable orthophoto tiles. As sets of orthophoto image tiles are delivered by geographic township corresponding ArcView polygon and point themes will be created. Checking procedure will start in the upper left corner of the screen and proceed back and forth through the image. As problems are found, either a point or polygon will be drawn and the Error\_Type and Comment fields will be populated. This field will contain the corresponding error code from the Problem Identification Key (*section V-4*). Additionally, a QC Progress Form (*section V-5*) will be completed for each delivered orthophoto tile. Once analyzed, the flagged orthophoto tiles will be returned to the selected Respondent for correction.

VI-4. **Problem Identification Key:** The Department has developed the following key to code problems found within delivered ArcInfo coverages and orthophoto tiles.

- 0- Unique problem ( doesn't fit any particular category)
- 1- Feature missing from coverage
- 2- Incorrect classification (bad attribute)
- 3- Incorrect coverage (belongs with another coverage)
- 4- Missing Attribute ( whole coverage - will not see)
- 5- Edgematch
- 6- Incorrect feature alignment (image edge)
- 7- Incorrect feature alignment (within image)
- 8- Foreign Artifact
- 9- Mosaicing (noticeable difference in contrast)
- 10- Blind spot
- 11- Scratch
- 12- Shadow ( score of 1)
- 13- Glare (Water)
- 14- Glare (Non-Water)
- 15- Contrast (Too High)
- 16- Contrast (Too low)
- 17- Brightness (Too High)
- 18- Brightness (Too dark)
- 19- Smeared or warped portion of image
- 20- Structure obscures view of planimetric feature
- 21- Ghosting /disappearing structures
- 22- Incorrect street centerline
- 23- Unknown blemish



- VI-5. **Digital Orthophoto QC Progress Form:** The Department has developed the following form to track QC progress for each Orthophoto tile received.

**MACOMB COUNTY DIGITAL ORTHOPHOTO QC PROGRESS FORM**

Date Received: \_\_\_\_\_  
 QC Technician: \_\_\_\_\_  
 Township: \_\_\_\_\_

Date QC'd: \_\_\_\_\_  
 SEC #: \_\_\_\_\_  
 SEC. 1/4: \_\_\_\_\_

**ORTHOPHOTO CHECK-IN PROCEDURE**

1. Is CD and Jewel case intact with no visible problems? **CORRECT** **INCORRECT**

COMMENTS:

2. Is the label sticker centered on the CD and uncreased? **CORRECT** **INCORRECT**

COMMENTS:

3. Does the file sizes appear to be appropriate? **CORRECT** **INCORRECT**

COMMENTS:

4. Do all the files open? **CORRECT** **INCORRECT**

COMMENTS:

5. Does index on CD jacket correspond with data on CD? **CORRECT** **INCORRECT**

COMMENTS:

6. Does contents match index printed on the CD? **CORRECT** **INCORRECT**

COMMENTS:

7. Does file naming convention match specifications? **CORRECT** **INCORRECT**

COMMENTS:

8. Is the metadata file present on the CD? **CORRECT** **INCORRECT**

COMMENTS:

9. Is the metadata able to be printed in a readable format? **CORRECT** **INCORRECT**

COMMENTS:

**DETAILED REVIEW OF IMAGES / VECTOR COVERAGES**

|    |                               |                |                  |
|----|-------------------------------|----------------|------------------|
| 1. | Accurate geographic position? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|-------------------------------|----------------|------------------|

COMMENTS:

|    |                             |                |                  |
|----|-----------------------------|----------------|------------------|
| 2. | Are photos tiled correctly? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|-----------------------------|----------------|------------------|

COMMENTS:

|    |                            |                |                  |
|----|----------------------------|----------------|------------------|
| 3. | Is photo contrast correct? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|----------------------------|----------------|------------------|

COMMENTS:

|    |                                   |                |                  |
|----|-----------------------------------|----------------|------------------|
| 4. | Are photo edges properly matched? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|-----------------------------------|----------------|------------------|

COMMENTS:

|    |   |                |                  |
|----|---|----------------|------------------|
| 5. | Does hydrology properly align with photo? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|---|----------------|------------------|

COMMENTS:

|    |  |                |                  |
|----|--|----------------|------------------|
| 6. | Does road centerline align with photo? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|--|----------------|------------------|

COMMENTS:

|    |   |                |                  |
|----|---|----------------|------------------|
| 7. | Are there major photo scratches at 1:1,200? | <b>CORRECT</b> | <b>INCORRECT</b> |
|----|---|----------------|------------------|

COMMENTS:

ADDITIONAL COMMENTS:

## **PART VII CRITERIA FOR SELECTION**

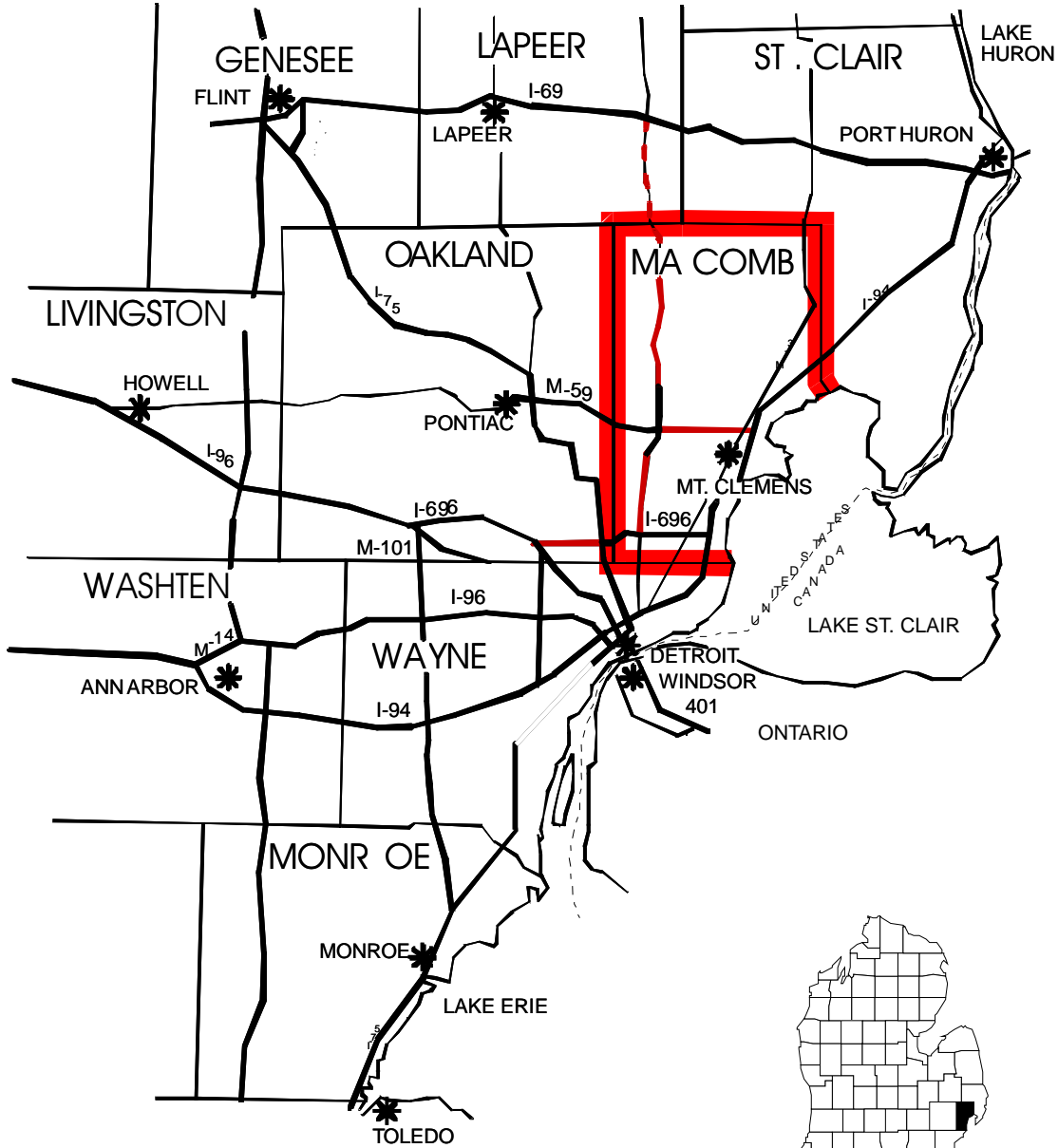
All quotations received shall be subject to an evaluation by the Department of Planning and Economic Development as deemed appropriate for the purpose of selecting the successful Respondent with whom a contract will be signed. The following factors will be considered in making the selection:

- III-1           **RFP Approach:** These criteria include the ability of the successful Respondent to meet the terms of the RFP, time constraints to supplying the conflated road centerline file and the quality/relevance of similar projects completed by the contractor. Emphasis will also be placed on the selected methodology of the contractor as well as incorporation of existing data and products.
- III-2.           **Personnel Experience and References:**
- Experience:** This refers to the competence of professional personnel who are assigned to the project. The evaluation will take into consideration the personnel assigned by the Respondent, as well as, the personnel assigned by the sub-contractors. Individuals on the team will be evaluated based on their education and experience, with particular reference to experience on projects similar to that described in this RFP.
- References from Other Clients:** Respondents will be compared with respect to their work with past clients. Criteria shall include efficiency and timeliness in the delivery of products.
- Work with Similar Size Counties:** RFPs will be evaluated based on the Respondent's past experience in working with similar size counties. Emphasis will be placed on previous experience with respect to the extent of prior contracts with multiple deliverables required.
- III-3.           **QA/QC Procedures:** This includes the level of detail in the procedure and how well it integrates with the workflow of the Department.
- III-4.           **CD of Previous Work:** This will comprise of a review of the sample products submitted on a cd.
- III-6.           **Price:** The review and selection process will use the estimated cost breakdown for the various sections of the RFP in evaluating all submittals.

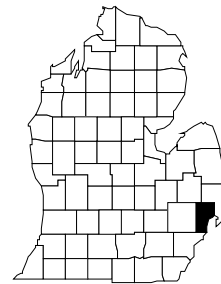
- III-6.       **Incorporation of Existing Data:** Comparison of RFPs will also be based on how well the proposal incorporates the use of existing data. In addition, special emphasis will be placed on the various methods selected for incorporating these data.

## ATTACHMENT A

### REGIONAL SETTING



### REGIONAL SETTING



Prepared by:  
Macomb County Department of Planning  
and Economic Development  
Phone: (313) 460-8296 Fax: (313) 460-8767

AN AGENCY OF THE MACOMB COUNTY BOARD OF COMMISSIONERS

**ATTACHMENT B**

**FORMAL INTENT TO RESPOND**

This form indicates the firm's intent to respond to this Request for Proposal

Firm Name: \_\_\_\_\_

Primary Contact Person: \_\_\_\_\_

Primary Contact Person Position: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

Email: \_\_\_\_\_

**MAIL TO:**

**Macomb County Purchasing Department – 13<sup>th</sup> Floor  
Attn: Mr. Wallace Evans, Purchasing Manager  
10 N. Main Street  
Mt. Clemens, Michigan 48043**

## ATTACHMENT C

### SECMCOG MACMGF ROAD CENTERLINE COVERAGE

#### Michigan Geographic Framework Version 1.0 Field Definitions

August 27, 1998

##### ARC/INFO Coverage Fields

| Field Name | Type | Size | Description          | Comments  |
|------------|------|------|----------------------|---|
| fnode#     | B    | 4    | From node number     | Arc/node topology has been built. Values are automatically updated in ARC/INFO when topology is edited and coverage is built. |
| tnode#     | B    | 4    | To node number       |   |
| lpoly#     | B    | 4    | Left polygon number  | Polygon topology has not been built. All values are equal to zero.  |
| rpoly#     | B    | 4    | Right polygon number |   |
| length     | F    | 4    | Arc length (in feet) | Values are automatically updated as coverage is edited.   |

##### Arc Identification Fields

| Field Name   | Type | Size | Description               | Comments  |
|--------------|------|------|---------------------------|---|
| <pre>mgf1#   | B    | 4    | ARC/INFO Internal ID      | Arc/node topology has been built. Unique IDs are automatically updated in ARC/INFO when topology is edited and coverage is built.                   |
| <pre>mgf1-id | B    | 4    | ARC/INFO User ID          | Set equal to the ARC/INFO Internal ID. Values remain static even when topology is edited and the coverage is built. Values may be manually updated. |
| <pre>mir_pid | N    | 13   | Parent ID of SEMCOG MIRIS | Relate item to the SEMCOG MIRIS coverage prior to conflation. ID is not unique. This field has a field  |

|            |   |    |                                   |   |
|------------|---|----|-----------------------------------|---|
|            |   |    |                                   | name alias called mali-id.  |
| tlid       | I | 10 | Parent ID of SEMCOG TIGER         | Relate item to the SEMCOG TIGER coverage prior to conflation. ID is not unique.         |
| tlid_old   | I | 10 | Parent ID of 1994 TIGER Line File | Relate item to the 1994 TIGER Line File prior to conflation. ID is not unique.          |
| mgfver1-id | B | 4  | MGF Version 1.0 ID                | Static unique ID used to relate back to this coverage if copied or edited.              |
| network-id | I | 10 | Transportation Network ID         | Relate item for TranPlan modeling and the Transportation Systems Monitoring (TSM) file. |



## Source Information Fields

| Field Name  | Type | Size | Description   | Comments  |
|-------------|------|------|---|---|
| version     | I    | 4    | Version release of the 1994 TIGER File  | Values only on arcs where TIGER attributes transferred over. All non-zero values are equal to 21. |
| source      | C    | 1    | Source code of TIGER data:<br><br>“ ” - Not Documented Elsewhere<br>A - Updated 1980 GBF/DIME-File<br>B - USGS 1:100,000-Scale<br>DLG-3 File<br>C - Other USGS Map<br>D - Census Bureau Update Prior to<br>Enumeration Operations<br>E - Census Bureau Enumerator<br>Update<br>F - Census Bureau Update From<br>Other Operations<br>G - Unconfirmed Local Official<br>Updates<br>H - Census Bureau Update Post-1990<br>Operations<br>I - TIGER–Master Address File<br>Building Operations | Values only on arcs where TIGER attributes transferred over.                                      |
| tigup       | I    | 10   | SEMCOG TIGER update code:<br><br>100 - 1994 TIGER arc<br>200 - New TIGER arc<br>300 - 1994 TIGER arc split<br>500 - New TIGER arc split   | Values only on arcs where TIGER attributes transferred over.                                      |
| <pre>mir_vs | N    | 13   | Conflation version code:<br><br>First digit, match code:<br>1 - MIRIS arc matched to TIGER<br>2 - MIRIS arc not matched to TIGER<br><br>Second digit, arc direction code:<br>0 - Same direction or no match<br>1 - Opposite direction<br><br>Third digit, interpolation code:<br>0 - Arc not split, attributes not<br>interpolated<br>1 - Arc split, attributes interpolated<br><br>Fifth digit, transfer type:<br>0 - MIRIS arc not matched to TIGER<br>1 - One-to-one match             | Indicates if and how TIGER attributes were transferred over.                                      |

|           |   |   |  |  |
|-----------|---|---|--|--|
|           |   |   | 5 - One TIGER to many MIRIS match<br>6 - Many TIGER to one MIRIS match<br>7 - Multiple match<br>8 - Manual transfer<br>9 - TIGER arc not matched to MIRIS,<br>arc appended to MIRIS                                      |  |
| semupdate | I | 3 | SEMCOG MIRIS update code:<br><br>0 - Non-road MIRIS arc or appended<br>TIGER arc<br>1 - Original MIRIS road arc<br>11 - New road arc added<br>21 - Original MIRIS road arc updated<br>31 - Original MIRIS road arc split |  |

## Feature Classification Fields

| Field Name | Type | Size | Description  | Comments  |
|------------|------|------|--|---|
| level      | I    | 2    | Feature classification code:<br>1 - Appended TIGER political / analytical boundary<br>2 - Arc added to close boundaries<br>5 - Appended TIGER hydrography<br>6 - MIRIS lake<br>7 - MIRIS river<br>8 - MIRIS drain<br>9 - MIRIS rail<br>10 - Appended TIGER rail<br>91 - MIRIS main rail<br>92 - MIRIS other rail<br>98 - Appended TIGER road<br>99 - MIRIS road  | Derived from the MIRIS level number. All arcs have been attributed. Values have been reconciled with CFCC values. |
| cfcc       | C    | 3    | Census feature classification code:<br>A           Unclassified road<br>A10 - A19   Limited access primary highway<br>A20 - A29   Primary highway, not limited access<br>A30 - A39   Secondary / Connecting highways and roads<br>A41 - A49   Local road<br>A50 - A59   Vehicular trail (trail or two-track)<br>A60 +       Access ramps, service drives, alleys, etc<br>B           Unclassified railroad<br>B10 - B19   Railroad main line<br>B20 - B29   Railroad spur<br>B30 - B39   Railroad yard<br>F           Unclassified nonvisible features and boundaries<br>F10         Nonvisible jurisdictional boundary<br>F23         Boundary closure extension<br>H           Unclassified hydrography<br>H01 - H09   Shoreline<br>H10 - H19   Stream, river, or wash<br>H21 - H29   Canal, ditch, or aqueduct<br>H30 - H39   Lake or pond<br>H40 +       Other Hydrography | All arcs have been attributed. Values have been reconciled with level values.                                     |
| symbol     | I    | 3    | Line symbol  | May be used as the line symbol item in ARC/INFO to display arcs in  |

|  |  |  |  |                                     |
|--|--|--|--|-------------------------------------|
|  |  |  |  | different line types and/or colors. |
|--|--|--|--|-------------------------------------|

## Feature Name Fields

| Field Name | Type | Size | Description                        | Comments  |
|------------|------|------|------------------------------------|---|
| fedirp     | C    | 2    | Feature prefix direction           | Nearly all named road arcs follow USPS street naming standards.   |
| fename     | C    | 30   | Feature name                       |   |
| fetype     | C    | 4    | Feature type                       |   |
| fedirs     | C    | 2    | Feature suffix direction           |   |
| fedirp2    | C    | 2    | Secondary feature prefix direction | Road name aliases (e.g., Ford Fwy for I-94 Fwy).  |
| fename2    | C    | 30   | Secondary feature name             |   |
| fetype2    | C    | 4    | Secondary feature type             |   |
| fedirs2    | C    | 2    | Secondary feature suffix direction |   |
| new_st     | C    | 21   | New street name                    | Additional street name information. This field may be used to further verify the correctness of primary road names. |

## Address Ranges and Zip Code Fields

| Field Name | Type | Size | Description             | Comments  |
|------------|------|------|-------------------------|---|
| fraddl     | I    | 11   | Left side from address  | Potential address ranges transferred from SEMCOG Updated TIGER.                                   |
| toaddl     | I    | 11   | Left side to address    |   |
| fraddr     | I    | 11   | Right side from address |   |
| toaddr     | I    | 11   | Right side to address   |   |
| zipl       | I    | 5    | Left side ZIP code      | ZIP codes transferred from SEMCOG Updated TIGER. ZIP codes do not form closed polygon boundaries. |
| zipr       | I    | 5    | Right side ZIP code     |   |

## Political Boundary Fields

| Field Name | Type | Size | Description                                     | Comments   |
|------------|------|------|---|--|
| fairl      | I    | 5    | Left side American Indian / Alaska Native Area  | American Indian / Alaska Native Areas do not exist in Southeast Michigan; therefore, all values are equal to 0.  |
| fairr      | I    | 5    | Right side American Indian / Alaska Native Area |  |
| statel     | I    | 2    | Left side state code                            | Although statel and stater values exist, this polygon boundary will be closed after seeming together all counties of the State.  |
| stater     | I    | 2    | Right side state code                           |  |
| countyl    | I    | 3    | Left side county code                           | County boundaries may be displayed by selecting countyl <> countyr. The county polygon boundary has been closed. All arcs have been assigned countyl and countyr values.             |
| countyr    | I    | 3    | Right side county code                          |  |
| fmcdl      | I    | 5    | Left side FIPS MCD code                         | Minor Civil Division (MCD) boundaries may be displayed by selecting fmcdl <> fmcdr. The MCD polygon boundaries have been closed. All arcs have been assigned fmcdl and fmcdr values. |
| fmcdr      | I    | 5    | Right side FIPS MCD code                        |  |
| fsmcdl     | I    | 5    | Left side FIPS sub-MCD code                     | Sub-MCDs do not exist in Southeast Michigan; therefore, all values are equal to 0.   |
| fsmcdl     | I    | 5    | Right side FIPS sub-MCD code                    |  |
| fppl       | I    | 5    | Left side FIPS place code                       | Place boundaries (villages) may be displayed by selecting fppl <> fplr. The place polygon boundaries have been closed. All arcs have been assigned fppl and fplr values.             |
| fplr       | I    | 5    | Right side FIPS place code                      |  |

## Jurisdiction / Precinct Boundary Fields

| Field Name | Type | Size | Description                               | Comments   |
|------------|------|------|---|--|
| uscl       | C    | 2    | Left side U.S. Congressional district     | Although uscl and uscr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with uscl and uscr values after the boundaries have been closed. |
| uscr       | C    | 2    | Right side U.S. Congressional district    |  |
| stsl       | C    | 2    | Left side Michigan State Senate district  | Although stsl and stsr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with stsl and stsr values after the boundaries have been closed. |
| stsr       | C    | 2    | Right side Michigan State Senate district |  |
| sthl       | C    | 3    | Left side Michigan State House district   | Although sthl and sthr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with sthl and sthr values after the boundaries have been closed. |
| sthr       | C    | 3    | Right side Michigan State House district  |  |
| ccdl       | C    | 2    | Left side County Commissioner district    | Although cccl and ccdr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with cccl and ccdr values after the boundaries have been closed. |
| ccdr       | C    | 2    | Right side County Commissioner district   |  |
| sdl        | C    | 5    | Left side school district FIPS code       | Although sdl and sdr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with sd and sdr values after the boundaries have been closed.      |
| sdr        | C    | 5    | Right side school district FIPS code      |  |
| pctl       | C    | 14   | Left side precinct                        | Although pctl and pctr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with pctl and pctr values after the boundaries have been closed. |
| pctr       | C    | 14   | Right side precinct                       |  |
| sdpl       | C    | 6    | Left side school district precinct        | The attributes of sdpl and sdpr have not yet been attributed.  |
| sdpr       | C    | 6    | Right side school district precinct       |  |
| vpl        | C    | 2    | Left side village precinct                | The attributes of vpl and vpr have not yet been attributed.  |
| vpr        | C    | 2    | Right side village precinct               |  |



## Census Geography Fields

| Field Name | Type | Size | Description                            | Comments   |
|------------|------|------|--|--|
| ctbnal     | C    | 6    | Left side Census Tract/BNA code        | Although ctbnal and ctbnar values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with ctbnal and ctbnar values after the boundaries have been closed. |
| ctbnar     | C    | 6    | Right side Census Tract/BNA code       |  |
| blkl       | C    | 4    | Left side Census tabulation block no.  | Although blkl and blkr values exist, these polygon boundaries have not yet been closed. All arcs will be assigned with blkl and blkr values after the boundaries have been closed.         |
| blkr       | C    | 4    | Right side Census tabulation block no. |  |

## Linear Referencing System Fields

| Field Name | Type | Size | Description                           | Comments  |
|------------|------|------|---------------------------------------|---|
| pr95       | I    | 8    | 1995 Primary/Physical Route/Road      | PR values from the 1995 MALI table were added to SEMCOG MIRIS where possible. New PRs values were then added to road arcs without a PR value. All road arcs with a PR value are named. These PR values should be used with pre-1995 and 1995 MALI-referenced data.                      |
| frmp95     | N    | 8.3  | 1995 From milepost                    | Milepost values from the 1995 MALI table were added to SEMCOG MIRIS where possible. In addition, mileposting may have been reformulated based on correct arc structure or interpolated based on arc length. These PR values should be used with pre-1995 and 1995 MALI-referenced data. |
| tomp95     | N    | 8.3  | 1995 To milepost                      |   |
| pr         | I    | 8    | Primary/Physical Route/Road ID number | MDOT's standards for the Linear Referencing System requires that PRs are continuous without gaps or overlaps in mileposting. These PR values are the same as pr95 except where PRs needed to be reassigned in order to follow MDOT's standards.   |



|            |   |     |  |  |
|------------|---|-----|--|--|
| frmp       | N | 8.3 | From milepost  | MDOT's standards for the Linear Referencing System requires that PRs are continuous without gaps or overlaps in mileposting. These milepost values are the same as frmp95 and tomp95 except where PRs needed to be reassigned in order to follow MDOT's standards.   |
| tomp       | N | 8.3 | To milepost  |  |
| travel_dir | I | 3   | Travel direction code:<br><br>0 - not coded<br>1 - one-way road arc<br>2 - two-way road arc  | All arcs in the transportation network (network-id > 0) and all known boulevard arcs will have a travel direction code assigned.   |
| blvd_num   | I | 3   | Boulevard code number  | Values greater than zero signify known boulevard arcs in addition to those already in the Transportation network.  |
| travel_mp  | I | 3   | Travel/Mileposting direction code:<br><br>0 - not coded<br>1 - mileposting direction opposes travel direction on a one-way road arc<br>2 - two-way road arc or mileposting direction is same as travel direction on a one-way road arc | <p>All arcs in the transportation network (network-id &gt; 0) and all known boulevard arcs will have a travel/mileposting direction code assigned.</p> <p>Dynamic segmentation in ARC/INFO requires that arcs are oriented in mileposting direction. This file follows this criteria. The field travel_mp identifies arcs whose mileposting direction is known to be opposing travel direction on one-way roads (important for TranPlan modeling).</p> |

### Transportation Analysis Fields

| Field Name | Type | Size | Description                          | Comments   |
|------------|------|------|--------------------------------------|--|
| mdotcs     | I    | 7    | Control section value                | Item has not been maintained by SEMCOG.  |
| cs_seq     | I    | 11   | Control section sequence number      | Item has not been maintained by SEMCOG.  |
| ramp-id    | C    | 6    | Ramp identification number           | Item has not been maintained by SEMCOG.  |
| anode      | I    | 5    | Transportation network from node no. | Items used in TranPlan modeling and in the Transportation Systems Monitoring (TSM) file. |
| bnode      | I    | 5    | Transportation network to node no.   |  |
| abnode     | C    | 10   | Transportation network link ID       | Redefined item that is a concatenation of anode and bnode values.                        |

**Type:**

B Binary  
 F Floating  
 I Integer  
 C Character  
 N Numeric

**ATTACHMENT D**

**MACOMB COUNTY GIS DATA DESIGNS**

**ATTACHMENT E**

**MICHIGAN GEOGRAPHIC FRAMEWORK  
ROAD CLASSIFICATION STANDARDS  
JULY 1996**

## ATTACHMENT F

### COST RESPONSE FORM

**Survey Control Network Densification** \$ \_\_\_\_\_

**Aerial Photo Acquisition** \$ \_\_\_\_\_

**Digital Orthophoto Production**

Orthophoto production \$ \_\_\_\_\_

¼ PLSS Image Set \$ \_\_\_\_\_

Geographic Township Image Set \$ \_\_\_\_\_

Countywide Image \$ \_\_\_\_\_

**Planimetric Compilation**

Road Centerline Capture \$ \_\_\_\_\_

Hydrography Capture \$ \_\_\_\_\_

Spatial alignment of SEMCOG MACMGF \$ \_\_\_\_\_

**Data Set Conflation**

Conflation of SEMCOG MACMGF \$ \_\_\_\_\_

Conflation of County Drains Hydrography \$ \_\_\_\_\_

**Table of Unique Road Names by Community** \$ \_\_\_\_\_

**Total Cost of Optional Planimetric Compliaton**

Optional Spatial alignment of

Community boundaries coverage \$ \_\_\_\_\_

Optional Spatial alignment of

Community CLEMIS law enforcement

Boundary coverages \$ \_\_\_\_\_

**Total Project Cost** \$ \_\_\_\_\_

Digital file production costs will include the cost of producing appropriate Metadata that will describe the lineage, quality and content of the files produced